

WHAT IS CLAIMED IS:

1. A method of manufacturing an optical fiber, the optical fiber comprising a core and a cladding and having a maximum relative refractive index difference of the core with the cladding of 0.3% to 0.5% and a mode field diameter of 8 micrometers to 10 micrometers at a wavelength of 1310 nanometers, comprising:
- heating at least a portion of an optical fiber preform;
- drawing an optical fiber at a speed of 500 meters per minute or more from the optical fiber preform heated; and
- impressing a spin on the optical fiber, while drawing, alternately in a clockwise direction and in a counterclockwise direction with a predetermined angle in such a manner that a maximum spatial frequency "y" of the spin per meter satisfies a relationship of
- $$\exp(24x-12) \leq y \leq 4$$
- where "x" is non-circularity of the cladding in percent, and that a polarization mode dispersion of the optical fiber manufactured is 0.5 ps/km^{1/2} or less at the wavelength of 1310 nanometers.
2. An apparatus for manufacturing an optical fiber, the optical fiber comprising a core and a cladding and having a maximum relative refractive index difference of the core with the cladding of 0.3% to 0.5% and a mode field diameter of 8 micrometers to 10 micrometers at a wavelength of 1310 nanometers, comprising:
- a drawing capstan that draws the optical fiber at a speed of

500 meters per minute or more; and

a plurality of guide rollers that guides the optical fiber being drawn, wherein

one of the guide rollers oscillates at a predetermined speed
5 with a predetermined angle to impress a spin on the optical fiber,
while drawing, alternately in a clockwise direction and in a
counterclockwise direction, in such a manner that a maximum
spatial frequency "y" of the spin per meter y satisfies a relationship
of

10 $\exp(24x-12) \leq y \leq 4$

where "x" is non-circularity of the cladding in percent, and that a
polarization mode dispersion of the optical fiber manufactured is 0.5
ps/km^{1/2} or less at the wavelength of 1310 nanometers.